

I claim:

1. A therapeutic probe adapted for insertion between a target tissue and an adjacent
5 tissue, the probe comprising:
 - a) a proximal end portion,
 - b) a distal end portion,
 - c) a longitudinal portion located between the proximal and distal end portions, the
10 longitudinal portion having an axial cross-section defining top and bottom surfaces, a
front side surface and a back side surface,
 - d) therapeutic agent-delivering means provided in the longitudinal portion and
adapted to deliver a therapeutic agent through the front side surface to the target
tissue,wherein the back side surface of the longitudinal portion is adapted to conform to a
15 contour of the adjacent tissue.
2. The probe of claim 1, wherein the back side surface comprises an expandable device
adapted to conform to the contour of the adjacent tissue.
- 20 3. The probe of claim 2, wherein the expandable device comprises a balloon.
4. The probe of claim 1, wherein the back side surface comprises an malleable portion
adapted to conform to the contour of the adjacent tissue.
- 25 5. The probe of claim 1, wherein the back side surface comprises a helical shape.
6. The probe of claim 1, wherein the back side surface has a portion having a concave
contour.
- 30 7. The probe of claim 6, wherein the concave contour of the back side surface is adapted
to conform to a spinal cord.

8. The probe of claim 1 wherein the proximal end portion comprises a first expandable portion adapted to conform to a proximal end of the adjacent tissue.

5 9. The probe of claim 1 wherein the distal end portion comprises a second expandable portion adapted to conform to a distal end of the adjacent tissue.

10. The probe of claim 1 wherein the therapeutic agent delivering means comprises an energy-delivering device.

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11. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:

a) a proximal end portion,

b) a distal end portion,

15 c) a longitudinal portion located between the proximal and distal end portions, the longitudinal portion having an axial cross-section defining an outer surface, and

d) therapeutic-agent delivering means provided in the longitudinal portion and adapted to deliver a therapeutic agent through the outer surface to the target tissue,

wherein the outer surface of the longitudinal portion comprises a threadform.

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12. The probe of claim 11, wherein the threadform comprises an expandable device.

13. The probe of claim 12 wherein the expandable device is adapted to conform to a contour of the adjacent tissue.

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14. The probe of claim 12, wherein the expandable device comprises a balloon.

15. The probe of claim 11, wherein the threadform comprises a malleable portion adapted to conform to a contour of the adjacent tissue.

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16. The probe of claim 15 wherein the malleable portion comprises a foam portion.

17. The probe of claim 11 wherein the target tissue is intervertebral disc tissue, and the proximal end portion comprises a first expandable portion adapted to conform to a proximal end of the disc tissue.

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18. The probe of claim 11 wherein the target tissue is intervertebral disc tissue, and the distal end portion comprises a second expandable portion adapted to conform to a distal end of the disc tissue.

10 19. The probe of claim 11 wherein the therapeutic agent delivering means comprises an energy-delivering device.

20. The probe of claim 19 wherein the energy-delivering device is an ultrasound transducer.

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21. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:

a) a proximal end portion,

b) a distal end portion,

20 c) a longitudinal portion located between the proximal and distal end portions, and

d) therapeutic-agent delivering means provided in the longitudinal portion and adapted to deliver a therapeutic agent to the target tissue,

wherein the distal end portion is adapted to conform to a contour of the adjacent tissue.

25 22. The probe of claim 21, wherein the distal end portion comprises an expandable device adapted to conform to the contour of the adjacent tissue.

23. The probe of claim 22, wherein the expandable device comprises a balloon.

30 24. The probe of claim 22 wherein the expandable device is filled with a radio-opaque material.

25. The probe of claim 21, wherein the distal end portion comprises a malleable portion adapted to conform to the contour of the adjacent tissue.
- 5 26. The probe of claim 21, wherein the distal end portion has a portion having a concave contour.
27. The probe of claim 21 wherein the distal end portion further comprises a radio-opaque material.
- 10 28. The probe of claim 21 wherein the target tissue is intervertebral disc tissue, and the proximal end portion comprises a first expandable portion adapted to conform to a proximal end of the disc tissue.
- 15 29. The probe of claim 21 wherein the target tissue is intervertebral disc tissue, and the distal end portion comprises a second expandable portion adapted to conform to a distal end of the disc tissue.
- 20 30. The probe of claim 21 wherein the therapeutic agent delivering means comprises an energy-delivering device.
31. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:
- a) a proximal end portion,
 - 25 b) a distal end portion,
 - c) a longitudinal portion located between the proximal and distal end portions, and
 - d) therapeutic agent-delivering means provided in the longitudinal portion and adapted to deliver a therapeutic agent to the target tissue,
- wherein the distal end portion comprises a radio-opaque contrast agent.

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32. The probe of claim 31, wherein the distal end portion further comprises an expandable device adapted to conform to a contour of the adjacent tissue.
33. The probe of claim 32, wherein the expandable device comprises a balloon.
- 5 34. The probe of claim 32 wherein the expandable device is filled with the radio-opaque agent.
35. The probe of claim 31, wherein the distal end portion further comprises a malleable portion adapted to conform to a contour of the adjacent tissue.
- 10 36. The probe of claim 31, wherein the distal end portion has a portion having a concave contour.
- 15 37. The probe of claim 31 wherein the target tissue is intervertebral disc tissue, and the proximal end portion comprises a first expandable portion adapted to conform to a proximal end of the disc tissue.
- 20 38. The probe of claim 31 wherein the target tissue is intervertebral disc tissue, and the distal end portion comprises a second expandable portion adapted to conform to a distal end of the disc tissue.
39. The probe of claim 31 wherein the therapeutic agent delivering means comprises an energy-delivering device.
- 25 40. The probe of claim 39 wherein the energy-delivering device is an ultrasound transducer.

41. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:
- a) a proximal end portion,
 - b) a distal end portion,
 - 5 c) a longitudinal portion located between the proximal and distal end portions, the longitudinal portion having an axial cross-section defining an outer surface,
 - d) therapeutic agent-delivering means provided in the longitudinal portion and adapted to deliver a therapeutic agent through the front side surface to the target tissue,
- 10 wherein the outer surface of the longitudinal portion comprises a retropulsion resistance means.
42. The probe of claim 41 wherein the target tissue is intervertebral disc tissue, and the retropulsion resistance means comprises an expandable portion located on the distal end
- 15 portion, the expandable portion being adapted to conform to a distal end of the disc tissue.
43. The probe of claim 42, wherein the adjacent issue is a spinal cord, and the outer surface comprises a back side surface comprising an expandable device adapted to
- 20 conform to a contour of the spinal cord.
44. The probe of claim 42, wherein the expandable device comprises a balloon.
45. The probe of claim 41, wherein the adjacent issue is a spinal cord, and the
- 25 retropulsion resistance means comprises a malleable portion located on the distal end portion and adapted to conform to a contour of the spinal cord.
46. The probe of claim 41 wherein the target tissue is intervertebral disc tissue, and the proximal end portion comprises an expandable portion adapted to conform to a proximal
- 30 end of the disc tissue.

47. The probe of claim 41 wherein the therapeutic agent delivering means comprises an energy-delivering device.

5 48. The probe of claim 47 wherein the energy-delivering device is an ultrasound transducer.

49. The probe of claim 41, wherein the outer surface comprises a malleable portion adapted to conform to the contour of the adjacent tissue.

10 50. The probe of claim 49 wherein the malleable portion comprises a foam portion.

51. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:

- 15 a) a proximal end portion,
- b) a distal end portion,
- c) a longitudinal portion located between the proximal and distal end portions, the longitudinal portion having an axial cross-section defining top and bottom surfaces, a front side surface and a back side surface,
- 20 d) therapeutic agent-delivering means provided in the longitudinal portion and adapted to deliver a therapeutic agent through the front side surface to the target tissue,

wherein the front side surface of the longitudinal portion has a front side dimension defining a height, the top side surface of the longitudinal portion has a top side dimension defining a width, and the front side dimension is greater than the top side
25 dimension so that the height/width ratio is greater than 1.

52. The probe of claim 51, wherein the adjacent tissue is a spinal cord, and wherein the back side surface comprises an expandable device adapted to conform to a contour of the spinal cord.

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53. The probe of claim 52, wherein the expandable device comprises a balloon.

54. The probe of claim 51, wherein the adjacent tissue is a spinal cord, and wherein the back side surface comprises an malleable portion adapted to conform to a contour of the spinal cord .

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55. The probe of claim 51, wherein the back side surface comprises a helical shape.

56. The probe of claim 51, wherein the back side surface has a portion having a concave contour.

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57. The probe of claim 56, wherein the adjacent tissue is a spinal cord, and wherein the concave contour of the back side surface is adapted to conform to the spinal cord.

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58. The probe of claim 51 wherein the target tissue is an intervertebral disc, and the proximal end portion comprises a first expandable portion adapted to conform to a proximal end of the disc tissue.

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59. The probe of claim 51 wherein the target tissue is an intervertebral disc, and the distal end portion comprises a second expandable portion adapted to conform to a distal end of the disc tissue.

60. The probe of claim 51 wherein the therapeutic agent delivering means comprises an energy-delivering device.

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61. A therapeutic probe adapted for insertion between a target tissue and an adjacent tissue, the probe comprising:

a) a proximal end portion,

b) a distal end portion,

c) a longitudinal portion located between the proximal and distal end portions, the longitudinal portion having an axial cross-section defining top and bottom surfaces, a front side surface and a back side surface,

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d) ultrasound -delivering means provided in the longitudinal portion and adapted to deliver ultrasound through the front side surface to the target tissue, wherein the longitudinal portion contains an ultrasound-coupling agent located adjacent to the front side surface.

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62. The probe of claim 61, wherein the adjacent tissue is a spinal cord, and wherein the front side surface comprises a first expandable device adapted to conform to a contour of the spinal cord.

10 63. The probe of claim 62, wherein the expandable device comprises a balloon.

64. The probe of claim 61, wherein the balloon is filled with the ultrasound-coupling agent.

15 65. The probe of claim 61, wherein the front side surface comprises a helical shape.

66. The probe of claim 61, wherein the back side surface has a portion having a concave contour.

20 67. The probe of claim 66, wherein the adjacent tissue is a spinal cord, and wherein the concave contour of the back side surface is adapted to conform to a contour of the spinal cord.

25 68. The probe of claim 61 wherein the target tissue is an intervertebral disc, and the proximal end portion comprises a second expandable portion adapted to conform to a proximal end of the disc tissue.

30 69. The probe of claim 61 wherein the target tissue is an intervertebral disc, and the distal end portion comprises a third expandable portion adapted to conform to a distal end of the disc tissue.

70. The probe of claim 61 wherein the therapeutic agent delivering means comprises an energy-delivering device.

71. A therapeutic probe adapted for insertion between a target tissue and an adjacent
5 tissue, the probe comprising:

- a) a proximal end portion,
- b) a distal end portion,
- c) a longitudinal portion located between the proximal and distal end portions, the longitudinal portion having an axial cross-section defining top and bottom surfaces, a
10 front side surface and a back side surface,
- d) ultrasound -delivering means provided in the longitudinal portion and adapted to deliver ultrasound through the front side surface to the target tissue,

wherein the ultrasound-delivering means comprises a plurality of ultrasound transducers.

15 72. The probe of claim 71, wherein the longitudinal portion contains an ultrasound-coupling agent located adjacent to the front side surface.

73. The probe of claim 72, wherein the adjacent tissue is a spinal cord, and the back side surface comprises a first expandable device adapted to conform to a contour of the spinal
20 cord.

74. The probe of claim 72, wherein the expandable device is filed with the ultrasound-coupling agent.

25 75. The probe of claim 71, wherein the front side surface comprises a helical shape.

76. The probe of claim 71, wherein the back side surface has a portion having a concave contour.

30 77. The probe of claim 76, wherein the adjacent tissue is a spinal cord, and the concave contour of the back side surface is adapted to conform to the spinal cord.

78. The probe of claim 71 wherein the target tissue is an intervertebral disc, and wherein the proximal end portion comprises a second expandable portion adapted to conform to the proximal end of the disc tissue.

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79. The probe of claim 71 wherein the target tissue is an intervertebral disc, and the distal end portion comprises a third expandable portion adapted to conform to a distal end of the disc tissue.

10 80. The probe of claim 71 wherein the therapeutic agent delivering means comprises an energy-delivering device.

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